REMARKS/ARGUMENTS

I. Double Patenting Rejections

Claims 22-26 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpetantable over claims 67-71 of copending Application No.09/537,861.

Applicant has filed a Terminal Disclaimer attached hereto and therefore overcome the provisional obviousness-type double patenting rejection. Applicant respectfully requests that the rejection be withdrawn.

II. Claim Rejections under 35 U.S.C. § 112

A. Deposit of Biological Materials.

Claims 22-26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most likely connected to make and or use the invention. In particular, the Office Action states that the antibody in the claimed invention must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. The Office Action asserts that the specification does not disclose a repeatable process to obtain the antibody linker and it is not apparent if it is readily available to the publiceC Nu

Applicant traverses the Office Action's statement that "the specification does not disclose a repeatable process to obtain the antibody linker". The claimed invention is directed to an antibody characterized by having binding affinity to a sperm cell wherein the sperm cell bound with the antibody retains the ability to fertilize an oocyte. Applicant has presented mAbC as one embodiment of the claimed invention. However, there is no lack of disclosure in the specification that provides a repeatable process to obtain an antibody in the claimed invention. For example, to determine whether an antibody binds to sperm cells, the sperm cells can be incubated with the antibody, washed, and incubated with a secondary antibody that recognizes the antibody and is conjugated with fluorescent materials. See, Example II, Paragraphs 0031-0033. The sperm cells bounded with antibodies are then placed in a flow-cytometry instrument or a

FACS sorter to count the fluorescence signals and determine the binding affinity of the antibody. Furthermore, to determined whether the sperm cell bound with the antibody retains the ability to fertilize an oocyte, the sperm cell bound with the antibody can be incubated with an oocyte and the resulting zygote may be cultured into blastocytes which are readily observable. See, Example III, Paragraphs 0036 – 0037. It is common knowledge that if an oocyte is unfertilized no blastocytes can be formed, much less observed. Accordingly, the specification provides a repeatable process to obtain an antibody characterized by having an affinity to a sperm cell wherein the sperm cell retains the ability to fertilize an oocyte.

Nonetheless, to advance the prosecution of the instant application, Applicant has provided a written assurance attached hereto to assure the Commissioner that an acceptable deposit will be made on or before the date of payment of the issue fee.

In light of the foregoing, Applicant respectfully requests the rejection be withdrawn.

B. Undue Experimentation.

Claims 22 – 26 are rejected under 35 U.S.C. 112, first paragraph, since the Office Action asserts that it would have required under experimentation for one skilled din the art to expect that the sperm-specific antibodies of the instant invention would retain the ability to fertilize an oocyte. in particular, the Office Action states that the state of art of antibodies directed to a sperm cell is such that one of skill in the art would expect such antibodies to inhibit fertilization. The Office Action further lists a few example of antibodies known in the art that inhibit fertilization.

Applicant respectfully reverses. At the onset, the claimed invention, as the office action admits, is directed to an antibody characterized by having binding affinity to a sperm cell and wherein the sperm cell bound with the antibody retains the ability to fertilize an oocyte. Those antibodies listed in the Office Action, however, once bound to a sperm cell, inhibit the sperm cell to fertilize an oocyte. It follows that these antibodies do not fall into the scope of the claimed invention.

Secondly, the fact that a few sperm binding antibodies in the art inhibit a sperm cell to fertilize does not mean the lack of the antibody that allows the sperm cell bound with the antibody to retain the ability to fertilize an oocyte. Quite to the contrary, Applicant has obtained an antibody, mAbC, that permits a sperm cell bound with mAbC to fertilize an oocyte.

Finally, the fact that a few sperm binding antibodies in the art inhibit a sperm cell to fertilize does not mean the need of undue experimentation to expect or obtain the claimed antibody that would allow the sperm cell to fertilize an oocyte. The standards of "undue experimentation" have long been established. It has been ruled that "it would not require undue experimentation to obtain antibodies needed to practice the claimed invention" when "there was considerable direction and guidance" in the specification, "all the methods needed to practice the claimed were well know", and working examples were provided in the disclosure. In re Wands, 858 F.2d 731 (Fed. Cir. 1988).

Applicant heeds precisely the Wands' ruling. Applicant provides considerable direction and guidance in the specification. For example, to determine whether an antibody binds to sperm cells, the sperm cells can be incubated with the antibody, washed, and incubated with a secondary antibody that recognizes the antibody and is conjugated with fluorescent materials. The sperm cells bounded with antibodies are then placed in a flow-cytometry instrument or a FACS sorter to count the fluorescence signals and determine the binding affinity of the antibody. See, Example II, Paragraphs 0031-0033. For another example, to determined whether the sperm cells bound with the antibody retain the ability to fertilize an oocyte, the sperm cells bound with the antibody are incubated with an oocyte and the resulting zygote may be cultured into blastocytes which are readily observable. See, Example III, Paragraphs 0036 – 0037. It is a common knowledge that blastocytes are formed only after an oocyte is fertilized. Additionally, Applicant reminds that all the methods needed to practice the claimed invention are well known. The methods of incubating antibodies with sperm cells, using a flow-cytometry instrument, and observing the formation of blastocytes, are all well known in the relevant art. Finally, as the Office Action concedes, Applicant provides working examples of using one of the antibodies of the claimed invention. Applicant teaches that transgenic mice and pigs can be generated using one embodiment of the

claimed invention, namely, mAbC. In light of Wands, Applicant finds no reason that it would require undue experimentation for one skilled in the art to expect or obtain the sperm-specific antibodies would retain the ability to fertilize an oocyte.

Accordingly, Applicant respectfully requests that the rejections of claims 22-26 be reconsidered and withdrawn.

C. 35 U.S.C. 112 second paragraph.

Claims 22-26 are rejected under 35 U.S.C. 112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The amended claims 22-26 now meet the requirements under 35 U.S.C. 112. Therefore, Applicant respectfully requests that the rejections be reconsidered and withdrawn.

In view of the foregoing, the claims 22-26 are in condition for allowance. Therefore, a Notice of Allowance is respectfully requested.

Respectfully submitted,
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Date: 11/27/02

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES IN PARAGRAPH 0004

[0004] Common vectors for introducing the therapeutic gene or nucleic acid include viral and non-viral vectors. Although viral delivery systems have been considered to be most efficient in delivering genes to cells, it may be limited because of a risk of triggering inflammatory or immunogenic responses. Forbes, S.J., "Review Article: Gene Therapy in Gastroenterology and Hepatology," *Aliment Pharmacol. Ther.* 11:823-826 (1997). The risk is exemplified by the death of Jesse Gelsinger, a volunteer who died on September 17, 1999 while participating in a gene therapy clinical trial at the Institute for Human Gene Therapy, University of Philadelphia. His death has fueled the controversy over the use and safety of gene therapy. The trial was directed to treat ornithine transcarbmylase (OTC) using a modified adenoviral vector. [`] The administration, however, of the vector to Gelsinger "initiated an unusual and deadly immune-system response that led to multiple organ failure and death." *See Preliminary Findings*, The Institute of Human Gene Therapy, University of Pennsylvania Health System, December 2, 1999[, <http://www.med.upenn.edu./ihgt/findings.html>]. Although adenoviral vectors offer several advantages over other viral vectors in that they can infect a wide range of cells and are not limited to replicating cells, as are retroviral vectors, adenoviral vectors may activate the immune system, as seen in the Gelsinger's case, such that the initial does or repeated introduction may become less effective, if not life threatening. *See also* Forbes, S.J., *supra*. Because other gene therapy vectors such as retrovirus or liposomes are generally foreign molecules, they similarly trigger the immune reaction and decrease the effectiveness of the therapy.

VERSION WITH MARKINGS TO SHOW CHANGES MADE IN THE CLAIMS

22. An antibody characterized by having binding affinity to a sperm cell, [and]wherein a sperm cell bound with the antibody retains the ability to fertilize an oocyte.

24. The antibody in claim 22 wherein the sperm cell is selected from [a]the group consisting of a mouse sperm cell, [cow] a bovine sperm cell, a pig sperm cell, a chicken sperm cell, a sheep sperm cell, and a goat sperm cell.

25. The antibody in claim 22 wherein the binding affinity to sperm cells is further characterized by the ability to bind to the sperm cells from a plurality of species of animal.

26. The antibody in claim 22 also exhibiting binding properties to a polynucleotide such that upon fertilization, the polynucleotide is introduced into the oocyte [zygote].

A CLEAN VERSION OF PARAGRAPH 0004

[0004] Common vectors for introducing the therapeutic gene or nucleic acid include viral and non-viral vectors. Although viral delivery systems have been considered to be most efficient in delivering genes to cells, it may be limited because of a risk of triggering inflammatory or immunogenic responses. Forbes, S.J., "Review Article: Gene Therapy in Gastroenterology and Hepatology," *Aliment Pharmacol. Ther.* 11:823-826 (1997). The risk is exemplified by the death of Jesse Gelsinger, a volunteer who died on September 17, 1999 while participating in a gene therapy clinical trial at the Institute for Human Gene Therapy, University of Philadelphia. His death has fueled the controversy over the use and safety of gene therapy. The trial was directed to treat ornithine transcarbmylase (OTC) using a modified adenoviral vector. The administration, however, of the vector to Gelsinger "initiated an unusual and deadly immune-system response that led to multiple organ failure and death." *See Preliminary Findings*, The Institute of Human Gene Therapy, University of Pennsylvania Health System, December 2, 1999. Although adenoviral vectors offer several advantages over other viral vectors in that they can infect a wide range of cells and are not limited to replicating cells, as are retroviral vectors, adenoviral vectors may activate the immune system, as seen in the Gelsinger's case, such that the initial does or repeated introduction may become less effective, if not life threatening. *See also* Forbes, S.J., *supra*. Because other gene therapy vectors such as retrovirus or liposomes are generally foreign molecules, they similarly trigger the immune reaction and decrease the effectiveness of the therapy.